

Numicon and the PYP



Your guide to linking **Numicon** to the International Baccalaureate Primary Years Programme **Mathematics Scope and Sequence**



This guide will show you how to use *Numicon* to support your teaching of the PYP Mathematics Scope and Sequence.

This flow diagram provides an example of how to use the Curriculum Mapping Tables in your classroom.

The Curriculum Mapping Tables link all the activities from the *Numicon* Teaching Resource Handbooks to the PYP Phases, Continuum and General Concept Goals.

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All ages in this booklet are intended as a guide.

About the author

David Lyttle (M.A., M.Ed., Dipl. Ed.) is the Specialist Learning Support Teacher in Elementary School Mathematics at the 'IB world school' the International School of Düsseldorf (ISD). He is also a *Numicon* Affiliated Trainer.



David has a strong interest and deep pedagogical knowledge in mathematical difficulties, prevention and intervention, as well as ways to support gifted and talented students.

He has developed a successful customized mathematics intervention programme using *Numicon* that caters for students from Grades 1 to 7. He has been instrumental in the training and utilization of *Numicon* at ISD as a classroom resource and as an enrichment tool.

David became a certified *Numicon* Affiliated Trainer in August 2015 and has extensive experience teaching staff, modelling, observing, assessing, and assisting teachers both at ISD and beyond. He continues to lead regular successful *Numicon* CPD workshops at ISD, as well as providing inset training to other International Schools in Europe. He appreciates the overall versatility and utility of *Numicon* to complement any mathematics programme at all levels. He values how *Numicon* helps make the underlying patterns in numbers real.

For more information on *Numicon* Professional Development available near you, please email training.international@oup.com

How to use the Curriculum Mapping Tables: An example lesson

1 Choose a Numicon Activity Group

Number, Pattern & Calculating 2 Teaching Resource Handbook

Pattern and Algebra 2 (Page 51)

Exploring the inverse relationship between adding and subtracting within 10.



2 Review Numicon Learning Opportunities

To reason with number relationships.

To develop mental imagery.



3 Apply PYP Continuum Concept

Pattern and Function Phase 2

Patterns can be represented using numbers and other symbols.



6 Link to General PYP Concept goals

Form: We want students to recognize and extend upon the patterns illustrated.

Connection: We want students to recognize the relationships between a family of facts.



5 Choose Specific Numicon Focus Activity

Activity 2: Exploring connections between adding and subtracting.

Know focus of learning: Number bonds, inverse relationships, the associative and commutative properties of addition.



4 Apply PYP Continuum Outcome

When **constructing meaning** learners:

Understand the inverse relationship of addition and subtraction.



7 Link to General PYP Concept goals

Follow steps in guide. Ensure time to: **explore, practice** and **reflect**. Use different materials, to show and compare number bonds in different ways.



8 Formative Assessment

Were the students successful in showing number relationships and bonds? At which level - concrete, pictorial, or abstract? How deep were the students' reflections?



9 Next Steps in Learning

Do the children need more focus activities in this group, or should the class move onto another activity grouping?

Cycle starts over.



Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
SF 1	Learning about Numicon shapes	1: Number	Numbers are connected	Transferring: Names to numerals to quantities	Form, Function
SF 2	Naming Numicon shapes	1: Number	Numbers are a naming system	Transferring: Names to numerals to quantities	Connection
SF 3	Building Numicon shapes	1: Pattern & Function	Patterns repeat and grow	Applying: Extend and create patterns	Change, Form
SF 4	Comparing and ordering	1: Pattern & Function	Patterns repeat and grow	Transferring: Describe patterns in various ways	Function, Change
SF 5	Describing relationships - adding	1: Number	Numbers are a naming system	Constructing: Understand 1-to-1 correspondence	Causation
SF 6	Naming number rods and teens	1: Number	Numbers are connected	Transferring: Names to numerals to quantities	Connection, Form
SF 7	Teen numbers and patterns	1: Number	Connections to build number sense	Transferring: Names to numerals to quantities	Function, Connection
SF 8	Introduction to subtraction	1: Number	Numbers can be used in many ways	Constructing: Relative magnitude	Function
SF 9	Sorting and practical subtracting	1: Number	Numbers can be used in many ways	Applying: Use number in real life situations	Connection
SF 10	Comparing lengths and weights	1: Measurement	Objects have attributes	Transferring: Compare and describe attributes	Function
SF 11	Counting and adding	1: Number	Numbers are connected	Applying: Count to determine objects in sets	Connection
SF 12	The '+' symbol & seeing patterns	1: Number	Numbers are connected	Applying: Numbers represent quantities	Function
P&A 1	Preparing for equivalence	1: Measurement 1: Number	Measurement is comparing objects Numbers are connected	Transferring: Compare and describe attributes Constructing: Use language of maths to compare	Function Change
P&A 2	Reasoning with Numicon shapes	1: Number	Numbers can be used in many ways	Applying: Count to determine objects in sets	Function
P&A 3	Odd and even	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Patterns can be found in Number	Form
P&A 4	Logic	1: Pattern & Function	Patterns occur in everyday situations	Applying: Extend and create patterns	Function, Connection
P&A 5	Finding possibilities	1: Pattern & Function	Patterns repeat and grow	Applying: Extend and create patterns	Connection
NNS 1	Ordering numbers to 20	1: Number	Numbers are connected	Constructing: Understand 1 to 1 correspondence	Causation, Connection
NNS 2	Finding how many by grouping	1: Number	Numbers are connected	Applying: Count to determine objects in sets	Causation, Connection
NNS 3	Exploring number lines & step counting	1: Number	Connections to build number sense	Constructing: Relative magnitude	Change, Form
NNS 4	Structure of 2 digit numbers	1: Number	Numbers are connected	Constructing: Relative magnitude	Function
C1	Introducing the subtracting symbol	1: Number	Numbers are connected	Constructing: Numbers are made different ways	Causation, Change
C2	Adding and subtracting 1 and 2	1: Pattern & Function	Patterns repeat and grow	Transferring: Describe patterns in various ways	Function, Change
C3	Money	1: Number	Connections to build number sense	Applying: Use numbers in real life situations	Connection
C4	Exploring A&S facts to 10	1: Number	Connections to build number sense	Constructing: Conservation of number	Form, Function
C5	Halves and quarters of wholes	1: Number	Numbers are connected	Applying: Use simple fraction names in real life	Form, Function
C6	Introduction to 'difference'	1: Number	Numbers are connected	Applying: Subitize in real-life situations	Connection, Perspective
C7	Developing A&S facts within 10	1: Number	Numbers are connected	Constructing: Numbers are made different ways	Causation, Perspective
C8	Adding more than two numbers	1: Number	Numbers are connected	Constructing: Relative magnitude	Change
C9	Partitioning into tens and ones	1: Number	Connections to build number sense	Constructing: Understand whole and part relationships	Form, Causation

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G1	Recognizing and naming 2D shapes	1: Shape & Space	Shapes can be described and organized	Constructing: 2D and 3D shapes can be described and compared	Connection
G2	Making pictures, shapes & patterns	1: Shape & Space	Shapes can be described and organized	Transferring: Sort and compare shapes	Form
G3	Imagining common 3D shapes	1: Shape & Space	Shapes can be described and organized	Constructing: 2D and 3D shapes can be described and compared	Connection
G4	Comparing and naming 3D shapes	1: Shape & Space	Shapes can be described and organized	Transferring: Sort and compare shapes	Form
G5	Position, direction, and movement	1: Shape & Space	Objects have a position in space	Constructing: Understand language of position	Responsibility
M1	Comparing, ordering & measuring length	1: Measurement	Objects can be measured non-standard	Applying: Describe observations in real life	Connection
M2	Introducing 1p, 2p, 5p, & 10p coins	1: Number	Numbers can be used in many ways	Constructing: Conservation of number	Form
M3	Units of time	1: Measurement	M involves comparing objects, events	Constructing: Daily routines can be sequenced	Form
M4	Comparing and ordering heaviness	1: Measurement	M involves comparing objects, events	Constructing: Identify and describe attributes	Function
M5	Comparing and ordering capacity	1: Measurement	M involves comparing objects, events	Applying: Solve real life problems of mass	Function
M6	Telling the time	1: Measurement	Events can be ordered and sequenced	Transferring: Sequence events in daily routine	Change, Responsibility



Key G = Geometry M = Measurement

Note In Numicon, Statistics is interwoven into the Geometry and Measurement activity groups, rather than being covered as a separate strand.

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
GS 1	Intro to number, pattern & calc 2	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Extend and create patterns	Causation, Function
P&A 1	Exploring different patterns	1: Pattern & Function	Patterns repeat and grow	Transferring: Describe patterns in various ways	Function, Change
P&A 2	Exploring inverse relationships	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Understand the inverse relationships of A&S	Form, Connection
P&A 3	Exploring equivalence	2: Pattern & Function	Patterns are seen in numbers & symbols	Transferring: Represent patterns in various ways	Form, Connection
P&A 4	Odd and even	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Patterns can be found in numbers	Form
P&A 5	Patterns and sequences 2, 3, 5, 10	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Extend and create patterns	Change, Connection
P&A 6	Logic	1: Pattern & Function	Patterns occur in everyday situations	Applying: Extend and create patterns	Function, Connection
P&A 7	Finding all possibilities	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Use properties of A&S to solve problems	Reflection, Causation
NNS 1	Counting to 100 and beyond	1: Number	Numbers are a naming system	Constructing: Last object counted is the quantity	Form, Change
NNS 2	2-digit numbers	1: Number	Numbers are a naming system	Constructing: Understand relative magnitude	Function
NNS 3	More 2-digit numbers	1: Number	Numbers are a naming system	Transferring: Connect names to quantities	Connection
NNS 4	Comparing and ordering numbers	1: Number	Numbers are connected	Applying: Use language of mathematics in real-life	Change
NNS 5	Rounding	2: Number	Methods for approximation and answers	Constructing: Estimate sums and differences	Reflection, Connection
NNS 6	Introducing fractions as numbers	1: Number	Numbers can be used in many ways	Applying: Use simple fractions in real-life	Form, Connection
C1	Adding and writing sentences	2: Pattern & Function	Patterns are seen in numbers and symbols	Constructing: Understand commutative properties	Connection
C2	Subtracting and writing sentences	2: Number	Operations of A&S and M&D are related	Constructing: Model A&S of whole numbers	Change
C3	Ordering adding and subtracting facts	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Extend and create patterns	Connection
C4	Adding and subtracting whole 10s	2: Number	Base-ten system shows relationships	Constructing: Model numbers to 100 with base-ten	Function, Causation
C5	Adding and subtracting 1 and 10	2: Number	Operations of A&S and M&D are related	Constructing: Model A&S of whole numbers	Change
C6	Partitioning 10s and units	2: Number	Base-ten system shows relationships	Transferring: Describe written strategies for A&S	Form, Connection
C7	A&S 1 digit numbers from 2 digit	2: Number	Base-ten system shows relationships	Applying: Use mental and written strategies for A&S	Responsibility
C8	Multiplying is repeated addition	2: Number	Operations of A&S and M&D are related	Constructing: Understand situations involving M&D	Form
C9	Learn times tables with arrays	2: Number	Operations of A&S and M&D are related	Applying: Selecting appropriate methods for solving	Perspective
C 10	Mental strategies – near doubles	1: Number	Numbers are connected	Constructing: Numbers are made in different ways	Connection
C 11	Bridging with multiples of 10	2: Number	Operations are modelled in many ways	Constructing: Model A&S of whole numbers	Perspective
C 12	Adding 3 or more 1 digit numbers	1: Number	Numbers are connected	Constructing: Numbers are built in a variety of ways	Connection, Change
C 13	A&S 2 digit numbers to 100	2: Number	Operations are modelled in many ways	Applying: Use mental and written strategies for A&S	Function
C 14	Adding and subtracting to 20	1: Number	Mental methods for answers	Constructing: Memorising A&S number facts	Reflection
C 15	Dividing is 'How many ... in ...'	2: Number	Operations of A&S and M&D are related	Constructing: Understand situations involving M&D	Responsibility
C 16	Halves, quarters and thirds of wholes	2: Number	Fractions represent part-whole ideas	Constructing: Model simple fractional relationships	Form, Connection

An example lesson for this activity can be found on page 3 of this guide.

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G 1	Making and classifying polygons	2: Shape & Space	Shapes can be described and organized	Constructing: 2D and 3D Shapes can be described and compared	Form
G 2	Identifying faces, edges and vertices of 3D shapes	2: Shape & Space	Shapes are classified and named according to their properties	Constructing: There are relationships between 2D and 3D shapes	Connection
G 3	Investigating symmetry	2: Shape & Space	Shapes are made up of parts that repeat in some way	Transferring: Identify lines of reflective symmetry	Causation
G 4	Recognizing and naming prisms	2: Shape & Space	Shapes are classified and named according to their properties	Applying: Recognize simple symmetrical designs in the environment	Form
G 5	Investigating and describing rotation	2: Shape & Space	Shapes are made up of parts that repeat in some way	Constructing: Understand that examples of symmetry and transformations can be found in our immediate environment	Connection
M 1	Introducing cm	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Constructing: Understand the use of standard units to measure	Function
M 2	Introducing 20p, 50p, and £1 coins	2: Number	Operations are modelled in many ways	Applying: Use numbers up to 100s in real life situations	Connection
M 3	Intro to £2 coin and £5, £10, £20 notes	2: Number	Operations are modelled in many ways	Applying: Use numbers up to 100s in real life situations	Connection
M 4	Introducing m	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Constructing: Understand the use of standard units to measure	Function
M 5	Introducing kg and g	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Constructing: Understand the use of standard units to measure	Function
M 6	Introducing L and ml & units of temperature	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Applying: Use standard units of measurement in real life situations	Connection
M 7	Telling the time and adding and subtracting with units of time	2: Measurement	We use tools to allow us to measure the attributes of objects and events	Transferring: Read and write the time to the hour, half hour, and quarter hour	Function

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Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
GS 1	Intro to number, pattern & calc 3	1: Pattern & Function	Patterns and sequences occur	Transferring: Describe patterns in various ways	Causation, Function
P&A 1	Explore inverse relationships of A&S	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Understand inverse relationships	Connection
P&A 2	Steps of constant size with multiples	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Patterns can be found in numbers	Form
P&A 3	Reading and creating scales	2: Data Handling	Information is expressed as structured data	Transferring: Represent data in graph forms	Connection
P&A 4	Extend sequences and differences	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Extend and create patterns	Change, Connection
P&A 5	Investigating general statement	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Use number patterns in real life	Reflection
NNS 1	How many groups 10s & 100s	2: Number	Base-ten system shows relationships	Constructing: Model numbers to 100 & beyond base-ten	Function, Causation
NNS 2	Using base 10 apparatus	2: Number	Base-ten system shows relationships	Constructing: Model numbers to 100 & beyond base-ten	Change
NNS 3	Keeping count, writing numbers	1: Data Handling	Organize objects and events to solve	Transferring: Represent information with pics & tally marks	Connection
NNS 4	Partitioning 2 and 3 digit numbers	1: Number	Connections builds number sense	Constructing: Numbers can be partitioned	Change
NNS 5	Ordering numbers to 1000	2: Number	Operations are modelled in many ways	Transferring: Compare and order cardinal numbers	Form
NNS 6	Finding half way and rounding	2: Number	Methods for approximation and answers	Constructing: Estimate sums and differences	Reflection, Connection
NNS 7	Fractions of whole and sets	2: Number	Fractions represent part-whole ideas	Constructing: Model simple fractional relationships	Reflection, Connection
NNS 8	Using fractions for discrete sets	2: Number	Fractions represent part-whole ideas	Applying: Use fractions in real-life situations	Form, Connection
C1	Developing fluency A&S to 10	2: Number	Operations of A&S and M&D are related	Applying: Fast recall of A&S number facts	Responsibility
C2	Developing fluency A&S to 20	2: Number	Operations of A&S and M&D are related	Applying: Fast recall of A&S number facts	Responsibility
C3	Mental methods for adding	2: Number	Apply mental computation methods	Applying: Use mental methods for A&S in real life	Change
C4	Mental methods for subtracting	2: Number	Apply mental computation methods	Applying: Use mental methods for A&S in real life	Change
C5	Revise multiplying as repeat adding	3: Pattern & Function	Functions associate two related things	Constructing: Multiplication is repeat adding	Connection
C6	Multiplying through arrays	3: Number	Complex operations can be modelled	Constructing: Model M&D of whole numbers	Form, Function
C7	Dividing is 'How many ... in ...'	2: Number	Operations of A&S and M&D are related	Constructing: Understand situations involving M&D	Function
C8	A&S multiples of 10 and 100	2: Number	Operations of A&S and M&D are related	Constructing: Understand situations involving M&D	Form
C9	Patterns with A&S calculations	2: Number	Operations are modelled in many ways	Constructing: Use language of A&S	Perspective
C 10	Multiplication facts with patterns	2: Pattern & Function	Whole numbers exhibit patterns	Transferring: Describe number patterns	Form
C 11	The sharing structure of division	2: Number	Operations of A&S and M&D are related	Constructing: Understand situations involving M&D	Function
C 12	Partitioning strategies for A&S	2: Number	Base-ten system shows relationships	Applying: Select appropriate method for solving	Reflection
C 13	Introducing column method A&S	2: Number	Operations are modelled in many ways	Constructing: Model A&S of whole numbers	Connection
C 14	Supporting column subtraction	2: Number	Operations are modelled in many ways	Transferring: Describe written A&S strategies	Form
C 15	Explore ratio and scaling	3: Pattern & Function	Analysing patterns help predictions	Transferring: Describe a rule for a pattern	Causation
C 16	Connection: division to fractions	2: Number	Fractions represent part-whole ideas	Applying: Read, write, and compare fractions	Connection

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G 1	Parts and properties of polygons and polyhedra	3: Shape & Space	Shapes can be transformed in different ways	Transferring: Sort, describe and model regular and irregular polygons	Form
G 2	Identifying and comparing angles by size	3: Measurement	Object and events have attributes that can be measured	Constructing: Understand an angle as a measure of rotation	Perspective
G 3	Sorting and classifying 2D and 3D shapes	2: Shape & Space	Shapes are classified and named according to their properties	Constructing: Recognize relationships among and between 2D and 3D shapes	Form
G 4	Using grids and grid references	2: Shape & Space	Specific vocabulary can be used to describe an object's position and space	Applying: Interpret and create simple directions	Change
M 1	Telling the time on 12hr clock	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Constructing: Understand that time is measured using universal units	Form
M 2	Exploring units of time	2: Measurement	Standard units allow us to have a common language to identify, order, and compare	Transferring: Estimate and compare lengths of time	Connection
M 3	Measuring with m, cm, and mm	2: Measurement	We use tools to measure the attributes of objects and events	Applying: Use standard units of measurement in real life situations	Function
M 4	Handling money	2: Measurement	We use tools to measure the attributes of objects and events	Applying: Use standard units of measurement in real life situations	Function
M 5	Measuring and calculating kg, and g	2: Measurement	We use tools to measure the attributes of objects and events	Applying: Use standard units of measurement in real life situations	Function
M 6	Measuring and calculating L, and ml	2: Measurement	We use tools to measure the attributes of objects and events	Applying: Use standard units of measurement in real life situations	Function

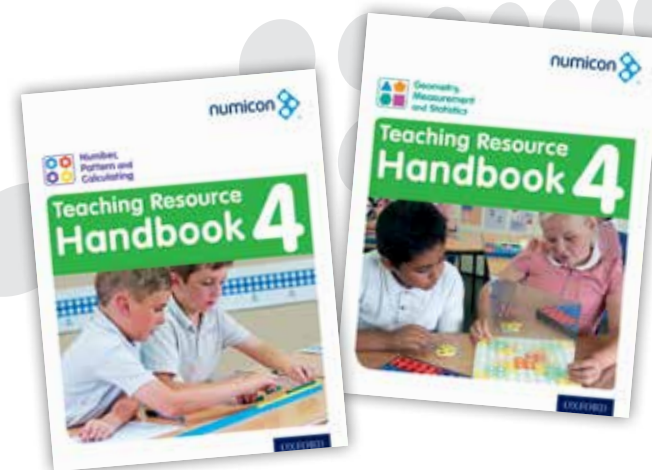


Key G = Geometry M = Measurement

Note In Numicon, Statistics is interwoven into the Geometry and Measurement activity groups, rather than being covered as a separate strand.

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
GS 1	Intro to Number, Pattern & Calc 4	2: Pattern & Function	Whole numbers exhibit patterns	Applying: Extend and create patterns	Causation, Function
P&A 1	Explore sequences and patterns	2: Pattern & Function	Patterns shown by number and symbols	Constructing: Represent patterns in many ways	Connection, Change
P&A 2	Exploring inverse relationships	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Understand inverse relationships	Connection
P&A 3	Explore '=' to balance sentences	3: Pattern & Function	Analyzing and identifying rules for patterns	Transferring: Represent rules for patterns	Reflection
P&A 4	Exploring multiples and factors	3: Number	Operations of A&S and M&D are related	Constructing: Use language of M&D e.g. factors	Perspective
P&A 5	Growth patterns in problem solving	3: Pattern & Function	Analyzing and identifying rules for patterns	Applying: Use number patterns to make predictions	Connection
P&A 6	Solving puzzles systematically	3: Pattern & Function	Functions associate two related things	Transferring: Describe a rule for a pattern	Function
P&A 7	Exploring general rules and logic	4: Pattern & Function	Patterns can be generalized	Transferring: Use a function to find a pattern rule	Connection
NNS 1	Place value of 4 digit numbers	3: Number	Base-ten can be extended for magnitude	Constructing: Model numbers to 1000s and beyond	Function
NNS 2	Ordering numbers beyond 1000	3: Number	Base-ten can be extended for magnitude	Transferring: Write, compare and order numbers	Connection
NNS 3	Estimating and rounding	3: Number	Operations of A&S and M&D are related	Applying: Estimate sum, difference etc. in real life	Change
NNS 4	Introducing to negative numbers	4: Number	The base-ten system extends both ways	Constructing: Model integers in appropriate context	Function
NNS 5	Fractions and part-whole ideas	3: Number	Fractions and decimals are part-whole ideas	Transferring: Read, write, and compare fractions	Causation
NNS 6	Introducing decimal fractions	3: Number	Fractions and decimals are part-whole ideas	Constructing: Model decimal fractions beyond 2dp	Change
NNS 7	Equivalence in fractions & proportion	3: Number	Fractions and decimals are part-whole ideas	Constructing: Model equivalent fractions	Connection
NNS 8	Decimal fractions to two decimal places	3: Number	Fractions and decimals are part-whole ideas	Applying: Use decimal fractions in real life	Connection
C1	A&S facts with inverses	2: Pattern & Function	Whole numbers exhibit patterns	Constructing: Understand inverse relationships	Form
C2	Bridging when adding and subtracting	2: Number	Operations of A&S and M&D are related	Applying: Select appropriate method for solving	Connection
C3	Fluency with mental adding ideas	2: Number	Apply mental computation methods	Applying: Use mental methods for A&S in real life	Function
C4	Fluency with mental subtracting ideas	2: Number	Apply mental computation methods	Applying: Use mental methods for A&S in real life	Function
C5	Fluency with multiplication to 12x12	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts	Form
C6	Fluency with division facts to 12x12	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts	Form, Connection
C7	M&D by 10s and 100s	3: Number	Complex operations can also be modelled	Constructing: Model M&D of whole numbers	Function
C8	Fluency with column method adding	3: Number	Complex operations can also be modelled	Applying: Select efficient method for solving	Change
C9	Fluency with column method subtracting	3: Number	Complex operations can also be modelled	Applying: Select efficient method for solving	Change
C 10	The distributive property multiplication	3: Pattern & Function	Analyzing and identifying rules for patterns	Constructing: Understanding commutative properties	Function
C 11	Using multiplication for division	3: Pattern & Function	Functions associate two related things	Constructing: Inverse relationship of M&D	Perspective, Connection
C 12	Short algorithm method of multiplication	3: Number	Complex operations can also be modelled	Constructing: Model M&D of whole numbers	Connection
C 13	Short algorithm method of division	3: Number	Complex operations can also be modelled	Constructing: Model M&D of whole numbers	Connection
C 14	Multi-step problems	3: Number	Complex operations can also be modelled	Applying: Use M&D strategies in real life	Responsibility

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G 1	Classifying triangles and quadrilaterals	3: Shape & Space	Geometric shapes and vocabulary are useful to represent and describe objects or events in real world	Constructing: Understand congruent or similar shapes	Form
G 2	Understanding reflective symmetry	3: Shape & Space	Shapes can be transformed in different ways	Constructing: Understand lines and axes of reflective and rotational symmetry	Connection
G 3	Investigating angles in shapes	4: Measurement	Accuracy of measurements depend on the situation and precision of the tool	Transferring: Measure and construct angles with a protractor	Reflection
G 4	Reading and plotting positions using coordinates	3: Shape & Space	Geometric shapes and vocabulary are useful to represent and describe objects or events in real world	Transferring: Locate features on a grid using coordinates	Function
M 1	Times and durations with 24h clock	3: Measurement	Relationships exist between standard units that measure the same attributes	Transferring: Read and write digital and analogue time on 12-hour and 24-hour clocks	Connection
M 2	Calculating with money amounts	3: Data Handling	Data can be collected, organized, displayed and analysed in different ways	Transferring: Collect, display and interpret data	Perspective
M 3	Using units of length and distance	3: Measurement	Relationships exist between standard units that measure the same attributes	Constructing: Understand the relationship between unit, e.g. m, cm and mm	Connection
M 4	Using units of mass	3: Measurement	Relationships exist between standard units that measure the same attributes	Constructing: Understand that measures can fall between numbers on a measurement scale	Function
M 5	Using units of capacity and volume	3: Measurement	Relationships exist between standard units that measure the same attributes	Constructing: Understand that measures can fall between numbers on a measurement scale	Function
M 6	Understanding perimeter and area	3: Measurement	Objects and evens have attributes that can be measured using appropriate tools	Constructing: Understand the use of standard units to measure perimeter, area and volume	Connection

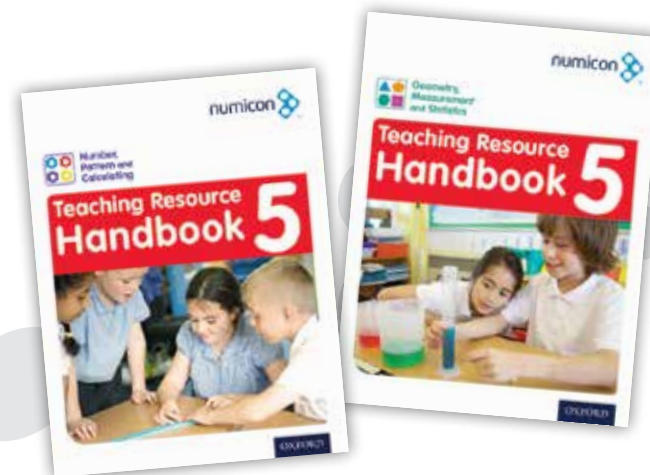


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Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
GS 1	Intro to Number, Pattern & Calc 5	3: Pattern & Function	Analysing and identifying patterns for rules	Applying: Use appropriate methods for patterns	Causation, Function
P&A 1	Explore sequences and patterns	3: Pattern & Function	Analysing and identifying patterns for rules	Transferring: Identify sequence of operations	Function
P&A 2	Using inverse relationships	3: Pattern & Function	Functions associate two related things	Constructing: Understand inverse relationships M&D	Connection
P&A 3	Properties of number	3: Pattern & Function	Analysing and identifying patterns for rules	Applying: Appropriate methods for representing patterns	Connection
P&A 4	Patterns for generalization	4: Pattern & Function	Patterns can be generalized	Transferring: Use a function to find a pattern rule	Function
P&A 5	Using equivalence for solving problems	3: Pattern & Function	Analysing and identifying patterns for rules	Transferring: Describe a rule for a pattern	Connection
P&A 6	Logic and reasoning	4: Pattern & Function	Patterns can be generalized	Transferring: Represent a rule for a pattern	Causation
NNS 1	Numbers up to a million	4: Number	Base-ten extends infinitely both ways	Constructing: Model numbers to millions and beyond	Change
NNS 2	Equivalence with fractions	4: Number	Fractions and decimals are part-whole ideas	Constructing: Use improper fractions and mixed numbers	Function
NNS 3	Understanding decimals	4: Number	Fractions and decimals are part-whole ideas	Constructing: Model decimal fractions to 4dp +	Function
NNS 4	Estimating and rounding	3: Number	Complex operations can also be modelled	Applying: Estimate sum, difference etc. in real life	Connection
NNS 5	Working with negative numbers	4: Number	Base-ten extends infinitely both ways	Constructing: Model integers in appropriate context	Function
NNS 6	Comparing and ordering fractions	4: Number	Fractions and decimals are part-whole ideas	Applying: Simplify fractions in computation answers	Connection
NNS 7	Problems with fractions and decimals	4: Number	Fractions and decimals are part-whole ideas	Applying: Use fractions, decimals in real life	Function
C1	Fluency with A&S inverses	3: Pattern & Function	Functions associate two related things	Constructing: Understand inverse relationships	Connection
C2	Bridging with A&S mentally	3: Number	Operations of A&S and M&D are related	Applying: Select efficient method for solving	Connection
C3	Further strategies for A&S	3: Number	Operations of A&S and M&D are related	Applying: Select efficient method for solving	Form
C4	Fluency with M&D	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts	Connection
C5	Written methods of adding	3: Number	Complex operations can also be modelled	Applying: A&S decimals in real life	Change
C6	Written methods of subtracting	3: Number	Complex operations can also be modelled	Applying: A&S decimals in real life	Change
C7	M&D by 10, 100 and 1000	3: Pattern & Function	Analysing and identifying patterns for rules	Applying: Use properties and relationships to solve	Connection, Change
C8	Mental methods for M&D	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts	Form, Connection
C9	Division with remainders	3: Number	Complex operations can also be modelled	Applying: Use M&D strategies in real life	Reflection
C 10	Proportion and ratio	4: Number	Ratios are a comparison of two quantities	Constructing: Model ratios	Change
C 11	Percentages	4: Number	Decimals and % are part-whole ideas	Constructing: Model percentages	Function
C 12	Written methods of multiplying	3: Number	Operations of A&S and M&D are related	Applying: Use M&D strategies in real life	Responsibility
C 13	Written methods of dividing	3: Number	Operations of A&S and M&D are related	Applying: Use M&D strategies in real life	Responsibility
C 14	Calculating fractions of amounts	4: Number	Use whole number ideas for R&P	Applying: Use fractions & % interchangeably in real life	Connection
C 15	Calculating with fractions	4: Number	Use whole number ideas for R&P	Applying: Use fractions & % interchangeably in real life	Connection
C 16	Multi-step problems	4: Number	Use whole number ideas for R&P	Applying: Use strategies to evaluate reasonableness	Reflection

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G 1	Measuring angles	4: Measurement	Accuracy of measurements depend on the situation and precision of the tool	Transferring: Measure and construct angles with a protractor	Responsibility
G 2	Transformations	3: Shape & Space	Shapes can be transformed in different ways	Constructing: Visualization of shape and space helps us solve problems	Causation
G 3	Exploring angles	4: Measurement	Accuracy of measurements depend on the situation and precision of the tool	Applying: Determine and justify level of accuracy required to solve real-life problems	Function
M 1	Metric and imperial units	4: Measurement	Conversions of units and measurements allow us to make sense of the world we live in	Constructing: Understand unit conversions within measurement systems	Perspective
M 2	Interpreting charts and graphs	3: Data Handling	Different graph forms highlight different aspects of data more accurately	Constructing: Data can be collected, displayed and interpreted in many ways	Function, Change
M 3	Calculating area and perimeter	4: Measurement	A range of procedures exist to measure different attributes of objects and events	Constructing: Understand the relationship between area, perimeter, volume and capacity.	Function
M 4	Estimating volume and capacity	4: Measurement	A range of procedures exist to measure different attributes of objects and events	Constructing: Understand the relationship between unit, e.g. m, cm and mm	Connection
M 5	Working with area and perimeter	4: Measurement	A range of procedures exist to measure different attributes of objects and events	Transferring: Develop and describe formulas for finding perimeter area and volume	Connection
M 6	Scale drawing	4: Shape & Space	Manipulation of shape and space takes place for a particular purpose	Constructing: Understand how scale is used to enlarge and reduce shapes	Form
M 7	Solving problems with time and money	4: Measurement	A range of procedures exist to measure different attributes of objects and events	Applying: Using timetables and schedules in real life situations	Responsibility



Key G = Geometry M = Measurement

Note In Numicon, Statistics is interwoven into the Geometry and Measurement activity groups, rather than being covered as a separate strand.

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
P&A 1	Multiples, factors and primes	4: Pattern & Function	Patterns can be generalized	Applying: Appropriate methods for representing patterns	Function
P&A 2	Exploring sequences and relationships	4: Pattern & Function	Exponents show repeated products	Constructing: Inverse relationships exponents & roots	Change
P&A 3	Using algebra to solve problems	4: Pattern & Function	Patterns can be generalized	Applying: Appropriate methods for representing patterns	Connection
P&A 4	Variables with symbol and letters	4: Pattern & Function	Patterns can be generalized	Applying: Using functions to solve problems	Causation
NNS 1	Numbers beyond 1 million	4: Number	Base-ten extends infinitely both ways	Constructing: Model numbers to millions and beyond	Change
NNS 2	Fractions	4: Number	Fractions and decimals are part-whole ideas	Applying: Use fractions and decimals in real life	Reflection
C 1	A&S negative numbers in context	4: Number	Base-ten extends infinitely both ways	Transferring: Read and write integers in context	Form
C 2	Multiplying and dividing	3: Number	Operations of A&S and M&D are related	Applying: Select efficient method for solving	Perspective
C 3	Estimating, rounding and equivalence	4: Number	Decimals use whole number calculations	Applying: Estimate and approximate in real life	Responsibility
C 4	Column methods for A&S	4: Number	Decimals use whole number calculations	Constructing: Model A&S and M&D of decimals	Form
C 5	Percentages	4: Number	Decimals and % are part-whole ideas	Transferring: Compare and order percentages	Connection
C 6	Multi-step non routine problems	4: Number	Base-ten extends infinitely both ways	Applying: Use strategies to evaluate reasonableness	Reflection
C 7	Ratio and proportion	4: Number	Ratios are a comparison of 2 quantities	Applying: Use fractions and % interchangeably in real life	Connection
C 8	Converting fractions and decimals	4: Number	Decimals and % are part-whole ideas	Applying: Use fractions and decimals in real life	Function
C 9	Column methods of multiplying	4: Number	Decimals use whole number calculations	Applying: Select efficient method for solving	Connection
C 10	Long division	4: Number	Decimals use whole number calculations	Applying: Select efficient method for solving	Connection
C 11	A&S with fractions	4: Number	Fractions and decimals are part-whole ideas	Applying: Use A&S, M&D fraction strategies in real life	Form
C 12	M&D with fractions	4: Number	Fractions and decimals are part-whole ideas	Applying: Use A&S, M&D fraction strategies in real life	Form
C 13	Unusual problems with all operations	4: Number	Fractions and decimals are part-whole ideas	Applying: Use A&S, M&D fraction strategies in real life	Reflection
PFT 1	Self assessment and imagery	3: Number	Complex operations can also be modelled	Applying: Use strategies to evaluate reasonableness	Reflection
PFT 2	Problem solving strategies	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts in real life	Perspective
PFT 3	Calculating whole numbers & DP	3: Number	Operations of A&S and M&D are related	Applying: Fast recall of M&D facts	Form
PFT 4	Calculating fractions and decimals	4: Number	Decimals use whole number calculations	Applying: Select and use appropriate operations	Form
PFT 5	Preparing for math test conditions	4: Pattern & Function	Patterns can be generalized	Applying: Appropriate methods for representing patterns	Reflection
I 1	Making squares	4: Pattern & Function	Patterns can be generalized	Transferring: Analyse the rule of a pattern	Connection
I 2	What did I do?	4: Pattern & Function	Patterns can be generalized	Transferring: Analyse the rule of a pattern	Reflection
I 3	How many ways?	4: Pattern & Function	Patterns can be generalized	Transferring: Represent rule or pattern with a function	Responsibility
I 4	Decimal Patterns	4: Pattern & Function	Patterns can be generalized	Constructing: Patterns can be analysed and generalized	Connection
I 5	Which is the best value?	4: Measurement	A range of procedures measure attributes	Applying: Justify accuracy in real life problems	Perspective
I 6	An enterprise project	4: Number	Ratios are a comparison of 2 quantities	Applying: Estimate and approximate in real life	Function

Numicon		Suggested PYP Links			
Activity Group	Activity Group Title (Short)	Phase & Continuum	Continuum Conceptual Understanding	Continuum Learning Outcome Option	General Concept Goal
G 1	2D shapes and angles	4: Shape & Space	Geometric tools and methods can be used to solve problems relating to shape and space	Transferring: Analyse, describe, classify, and visualize 2D and 3D shapes using geometric vocabulary	Function
G 2	Circles	4: Shape & Space	Consolidating what we know of geometric concepts allows us to make sense and interact with our world	Constructing: Understand the properties of circles	Connection
G 3	Transformations in the four quadrants	4: Shape & Space	Shapes can be transformed in different ways	Applying: Apply knowledge of transformations to problem-solving situations	Change
M 1	Statistics, charts and graphs	4: Data Handling	Data can be presented effectively for valid interpretation and communication	Constructing: Understand different types of graphs have special purposes	Perspective
M 2	Areas of 2D shapes	4: Shape & Space	Geometric tools and methods can be used to solve problems relating to shape and space	Transferring: Explore and use geometric ideas and relationships to solve problems in other areas of mathematics	Connection
M 3	3D shapes – nets and surface area	4: Shape & Space	A range of procedures exist to measure different attributes of objects and events	Transferring: Create and model how a 2D net converts into a 3D shape and vice versa	Function
M 4	Volume and scaling	4: Shape & Space	Manipulation of shape and space takes place for a particular purpose	Constructing: Understand how scale is used to enlarge and reduce shapes	Connection
I 1	Shape shifting	4: Shape & Space	Manipulation of shape and space takes place for a particular purpose	Constructing: Understanding the properties of regular and irregular polyhedra	Form
I 2	Macro maths	4: Measurement	A range of procedures exists to measure different attributes of objects and events	Applying: Select and use appropriate units of measurement and tools to solve problems in real-life situations	Responsibility
I 3	Interesting information	4: Pattern & Function	Patterns can be generalized	Applying: Use functions to solve problems	Reflection

Key G = Geometry I = Investigating M = Measurement

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